

***** MAINTAIN PROPRIETARY CONFIDENTIALITY *****

THE B. N. S. F. RAILWAY COMPANY
FHPM ESTIMATE FOR
STATE OF ILLINOIS

LOCATION:- SOMONAUK DETAILS OF ESTIMATE PLAN ITEM: PS10796048 VERSION: 1

PURPOSE, JUSTIFICATION AND DESCRIPTION

SIGNAL COST TO ADD SIMULTANEOUS PREEMPTION & INSTALL NEW GATES, FLASHERS & CONSTANT WARNING CIRCUITRY AT (GLETTY RD DOT 079 604 B) NEAR SANDWICH, IL L/S 0001 MP 57.03 ON THE CHICAGO DIV.....MENDOTA SUBDIV

THE MATERIAL LIST BELOW REFLECTS TYPICAL REPRESENTATIVE PACKAGES USED FOR ESTIMATING PURPOSE ONLY.

THEY CAN BE EXPECTED TO CHANGE AFTER THE ENGINEERING PROCESS, DETAILED AND ACCURATE MATERIAL LISTS WILL BE FURNISHED WHEN ENGINEERING IS COMPLETED.

CONTINUING CONTRACTS HAVE BEEN ESTABLISHED FOR PORTIONS OF SIGNAL WORK ON THE BNSF RAILROAD.

THIS ESTIMATE GOOD FOR 90 DAYS. THEREAFTER THE ESTIMATE IS SUBJECT TO CHANGE IN COST FOR MATERIAL, LABOR, AND OVERHEADS.

***** SIGNAL WORK ONLY *****

THE STATE OF ILLINOIS IS FUNDING THIS PROJECT 100%.

NOTE: THIS ESTIMATE CONTAINS COST TO UPGRADE CIRCUITRY AT NEW SOMONAUK RD DOT 079 606 P DUE TO THE CURCUIT COMPATIBILITY WITH GLETTY RD.

MAINTAIN PROPRIETARY CONFIDENTIALITY

DESCRIPTION	QUANTITY	U/M	COST	TOTAL \$

LABOR				

ELECTRICAL LABOR F/POWER TRANS SYS	54.00	MH	1,174	
PLACE FIELD WELDS	69.76	MH	1,410	
PLACE OTM	34.88	MH	669	
SIGNAL FIELD LABOR	1792.00	MH	42,761	
SIGNAL SHOP LABOR	80.00	MH	1,676	
PAYROLL ASSOCIATED COSTS			26,436	
EQUIPMENT EXPENSES			8,535	
DA LABOR OVERHEADS			29,881	
INSURANCE EXPENSES			7,519	
TOTAL LABOR COST			120,061	120,061

MATERIAL				

PLUG RAIL, 132# INSULATED,BONDED, 40 FT	4.00	EA X	2,067	
WELDKIT, GENERIC FOR ALL RAIL WEIGHTS	8.00	KT X	470	
BATTERY	1.00	LS N	8,462	
BUNGALOW 6X6	1.00	EA N	5,421	
BUNGALOW MATERIAL	1.00	LS N	7,142	
CABLE	1.00	EA N	2,152	
CHARGERS	1.00	LS N	1,044	
DWBS	1.00	LS N	3,773	
ELECTRICAL MTRL	1.00	EA	1,500	
FIELD MATERIAL	1.00	LS N	6,500	
GATE KEEPER	2.00	EA N	3,512	
HALF OVAL GUARD RAIL	1.00	EA N	456	
HXP3R2 SYSTEM	2.00	EA N	37,426	
MISC. MATERIAL	1.00	EA N	2,500	
MODEL 95 GATES MECH COMPLETE	2.00	EA N	10,110	
ONE WAY SIDELIGHT ASSY	2.00	EA N	1,440	
PREEMPT INTERFACE BOX	1.00	EA N	260	
PREEMPT RELAY W/ BASE	1.00	EA N	397	
SOMONAUK RD XING UPGRADE	1.00	LS N	51,101	
VIGILANT RECORDER	1.00	EA N	1,684	
MATERIAL HANDLING			99	
USE TAX			9,431	
OFFLINE TRANSPORTATION			1,848	
TOTAL MATERIAL COST			158,795	158,795

OTHER

AC POWER SERVICE	1.00	EA	5,000
CONTRACT ENGR.	1.00	EA N	10,000
FILL DIRT	25.00	CY N	625
MACHINE RENTAL	1.00	EA N	6,656
SURFACE ROCK	20.00	CY N	500

TOTAL OTHER ITEMS COST	22,781	22,781
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PROJECT SUBTOTAL	301,637
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CONTINGENCIES	30,163
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BILL PREPARATION FEE	1,659
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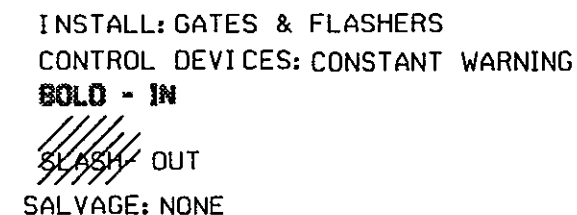
GROSS PROJECT COST	333,459
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LESS COST PAID BY BNSF	0
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TOTAL BILLABLE COST	333,459
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TO SANDWICH



- Warning device placement:
- Clearance to C.L. Track = Min. 12', Max. 20'
 - Edge of Road to C.L. Foundations:
 - Min. 4'1" with curb,
 - Min. 8'1" without curb,
 - Max. 12'
 - House Clearance: 25' Min. to C.L. of Track
 - Front Lights: 30' Min. to Edge of Road
 - Back and Side Lights: 30-15 Degree Lenses
 - Cantilever Jury Mast: 70 Degree Lenses
 - Cantilever Jury Mast: 20-32 Degree Lenses

BNSF RAILWAY CO.
SANDWICH, IL.
GLETTY ROAD
LS 0001 MENDOTA SUBDIVISION
MP. 57.03 CHICAGO DIVISION
DOT* 079 604 B
KANSAS CITY
NO SCALE DATE: 06/18/02
FILE: 000157_03.DGN
MCR/TLF

US 34 @ Gletty Rd.

PROPOSED MINIMUM PREEMPTION TIME

	TIME NEEDED
Delay	1.0
Minimum Green (sec)	1.0
Yellow Interval (sec)	4.5
All Red Interval (sec)	1.5
Maximum Time Prior to Track Clear Phase	8.0
Track Clearance (sec)	8.0
Separation Time	9.0
Track Clear Green	17.0
Min. RR Warning Time Required (Total seconds)	25.0

PROCEDURE FOR ESTABLISHING MINIMUM PREEMPTION TIMES AT INTERCONNECTED CROSSINGS

PHASE I	PHASE II	PHASE III
Clearance Interval	Queue Clearance	Separation Time Safety Factor
<p>(This is a set time within the traffic signal controller which reflects the maximum worst case time it will take for the signal on the track approach to get a green light.)</p> <p>FACTORS:</p> <ul style="list-style-type: none"> • pedestrian signal phase • vehicle clearance phase 	<p>(This is a variable time which reflects the amount of time required to clear a vehicle to a point beyond the tracks.)</p> <p>FACTORS</p> <ul style="list-style-type: none"> • storage area length • crossing geometrics • queue length • distance between track and intersection 	<p>(This is a fixed time of 9 seconds which is needed to compensate for a variety of variables outside of the Department's control.)</p> <p>FACTORS</p> <ul style="list-style-type: none"> • weather • vehicle defects • motorist reaction • motorist behavior • busses/large trucks hauling hazardous cargo • time of day

The minimum preemption time at interconnected crossings consists of the following three components:

1. The clearance interval phase is the maximum worst case time it will take for the traffic signal to clear to a green light for the track approach. It is the Department's policy to get to this green as quickly as possible by immediately terminating any pedestrian WALK indications, abbreviating the pedestrian clearance interval and running it concurrently with the vehicular clearance phase on the cross street. Local agencies should be notified of this abbreviated time to ensure it does not conflict with designated school routes or other conditions. This time will include a 1 second delay upon receiving the signal from the railroad to limit the number of false calls received, a 1 second minimum green for the through movement, the amber clearance, and any all red time included in the timing sequence.

2. The queue clearance phase is the amount of time required to clear a vehicle that has fouled the stop bar, located prior to the tracks, to a point either completely through the intersection, for storage areas less than 15 m (50 ft) or to a point where the rear of the vehicle is 1.83 m (6 ft) from the near rail

for longer storage areas. This time should be determined by field observations conducted in the manner described below in the section captioned "Data Collection."

3. The **separation time safety factor phase** is an amount of time added to ensure that a vehicle is not just clearing the tracks as the train enters the crossing. This is important to keep both the motorist and the engineer from taking emergency actions. This time has been fixed at 9 seconds.

- Data collection: Field measurements of queue clearances are taken for three hours during times of peak flow to determine the length of the queue clearance phase. The resultant field surveys also note for consideration any conditions which may delay queue clearance, such as heavy pedestrian crossing volumes and pedestrian violations of signal indications. If during the observation period, queues do not get past the tracks and foul the stop bar located prior to the tracks, then data collected from similar locations is used. Factors taken into consideration when choosing another location due to a lack of queuing, include, but are not limited to, similar traffic conditions, geometrics, approach grades, and storage distances.

The following table is completed for each minimum preemption time calculated:

Delay	1 sec
Minimum Green	1 sec
Yellow Interval	sec
All Red Interval	sec
Max. Time Prior to Track Clear Green (Clearance Interval)	sec
Track Clear Green (Queue Clearance)	sec
Separation Time	9 sec
Minimum Preemption Time Required	sec